CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Mission Incident
Santa Paula, CA
Preliminary Summary of Air Monitoring Results
November 26, 2014

Prepared by
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CTEH® CENTER FOR TOXICOLOGY AND ENVIRONMENTAL HEALTH, LLC

Introduction

Center for Toxicology and Environmental Health, LLC (CTEH®) continued air monitoring in support of response activities following a vac truck explosion and fire in Santa Paula, CA.

This submittal summarizes air monitoring data for November 26, 2014 07:00 to November 27, 2014 07:00.

Real-time Air Monitoring

All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Manually-logged real-time air monitoring was conducted for chlorine (Cl_2), hydrogen sulfide (H_2S), percent of the Lower Explosive Limit (LEL), oxygen (O_2), peroxides, sulfur dioxide (SO_2), sulfuric acid (H_2SO_4), particulate matter (10-micron particles, PM_{10}), and volatile organic compounds (VOCs), with instruments such as Gastec® pumps with chemical-specific colorimetric tubes, RAESystems® MultiRAE Plus and MultiRAE Pro PID with chemical-specific sensors, and TSI® AM510s for particulate matter. Monitoring was conducted by CTEH® personnel in the work area, at fixed locations in the surrounding community, and along the perimeter of the facility in the community. Table 1 summarizes monitoring data for manually-logged real-time readings. Maps including the site location, fixed community real-time air monitoring locations, aerial site photo, and roaming monitoring are included in Appendix A.

CTEH® monitored RAESystems© AreaRAE units with ProRAE Guardian system at four locations on the fence line of the facility within the work area. AreaRAEs were equipped with sensors to detect VOCs, LEL, H_2S, and SO_2. Table 2 summarizes monitoring data for AreaRAE monitoring. The LEL detections reported at AreaRAE Unit 02 and the H_2S detections on Units 03 and 04 were identified as confirmed sensor drift by CTEH® personnel using a secondary instrument. AreaRAE graphs displaying real-time air monitoring data as well as 15-minute rolling averages and a map depicting AreaRAE locations are included in Appendix B.

Additional particulate monitoring was conducted around the facility perimeter within the work area. TSI AM510 SidePak aerosol monitors equipped with 10-micron impactors were collocated with the AreaRAE units. An instantaneous detection of particulate matter of 1.98 mg/m^3 was recorded at location AR04 below the work area action level of 3 mg/m^3; this reading was instantaneous and no sustained trend in detections was recorded during this time period. Table 3 summarizes monitoring data for data-logged AM510 units.

Table 1: Manually-Logged Real-Time Air Monitoring Summary[1]
November 26, 2014 07:00 – November 27, 2014 07:00

Location Category	Analyte	Instrument	No. of Readings	No. of Detections	Avg. of Detections	Concentration Range
Community	Cl_2	Gastec 8La	1	0	NA	<0.05 ppm
		MR+	15	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	15	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	15	0	NA	<1 %
	O_2	MR+ / MR Pro	15	15	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	15	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	15	15	0.019	0.001 - 0.04 mg/m^3
	H_2SO_4	Gastec 35	15	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	15	0	NA	<0.1 ppm
Exclusion Zone	Cl_2	MR+	2	0	NA	<0.1 ppm
	H_2S	MR+ / MR Pro	3	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	3	0	NA	<1 %
	O_2	MR+ / MR Pro	2	2	20.9	20.9 - 20.9 %
	VOC	MR+ / MR Pro	2	0	NA	<0.1 ppm
Work Area	Cl_2	Gastec 8La	3	0	NA	<0.05 ppm
		MR+ / MR Pro	19	0	NA	<0.1 ppm
	CO	MR	5	0	NA	<1 ppm
	H_2S	MR+ / MR Pro	33	0	NA	<0.1 ppm
	LEL	MR+ / MR Pro	28	0	NA	<1 %
	O_2	MR+ / MR Pro	16	16	20.9	20.9 - 20.9 %
	Peroxides	Gastec 32	12	0	NA	<0.1 ppm
	PM_{10}	AM510/Dusttrak	1	1	0.005	0.005 - 0.005 mg/m^3
	SO_2	MR+	12	0	NA	<0.1 ppm
	H_2SO_4	Gastec 35	10	0	NA	<0.2 mg/m^3
	VOC	MR+ / MR Pro	35	0	NA	<0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 2: AreaRAE Air Monitoring Summary[1]
November 26, 2014 07:00 – November 27, 2014 07:00

Unit ID	Analyte	No. of Readings	No. of Detections	Avg. of Detections	Detection Range
Unit 01	H_2S	5256	150	0.2 ppm	0.1 - 0.4 ppm
	LEL	5256	0	NA	< 1 %
	SO_2	5256	0	NA	< 0.1 ppm
	VOC	5256	17	0.1 ppm	0.1 - 0.2 ppm
Unit 02	H_2S	5369	636	0.1 ppm	0.1 - 0.3 ppm
	LEL	5369	32	3%	2.7 - 3.1 %
	SO_2	5369	4	0.1 ppm	0.1 - 0.1 ppm
	VOC	5369	1077	0.1 ppm	0.1 - 0.5 ppm
Unit 03	H_2S	5549	215	0.1 ppm	0.1 - 0.2 ppm
	LEL	5549	0	NA	< 1 %
	SO_2	5549	2	0.1 ppm	0.1 - 0.1 ppm
	VOC	5549	33	0.1 ppm	0.1 - 0.1 ppm
Unit 04	H_2S	5584	160	0.1 ppm	0.1 - 0.2 ppm
	LEL	5584	0	NA	< 1 %
	SO_2	5584	0	NA	< 0.1 ppm
	VOC	5584	228	0.1 ppm	0.1 - 0.1 ppm

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*
[2]*Maximum detections preceded by the "<" symbol are considered non-detects below reporting limit to the right.*

Table 3: Data-logged AM510 Particulate (PM_{10}) Monitoring Summary[1]
November 26, 2014 07:00 – November 27, 2014 07:00

Serial No.	Location	No. of Readings	No. of Detections	Avg. Detection	Detection Range
10408088	AR01	5279	5279	0.01	0.004 - 0.135 mg/m^3
10704074	AR02	5321	5321	0.01	0.001 - 0.237 mg/m^3
11005015	AR03	5312	4886	0.013	0.001 - 0.231 mg/m^3
10408087	AR04	4600	2925	0.333	0.001 - 1.968 mg/m^3

[1]*Note: The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.*

Appendix A

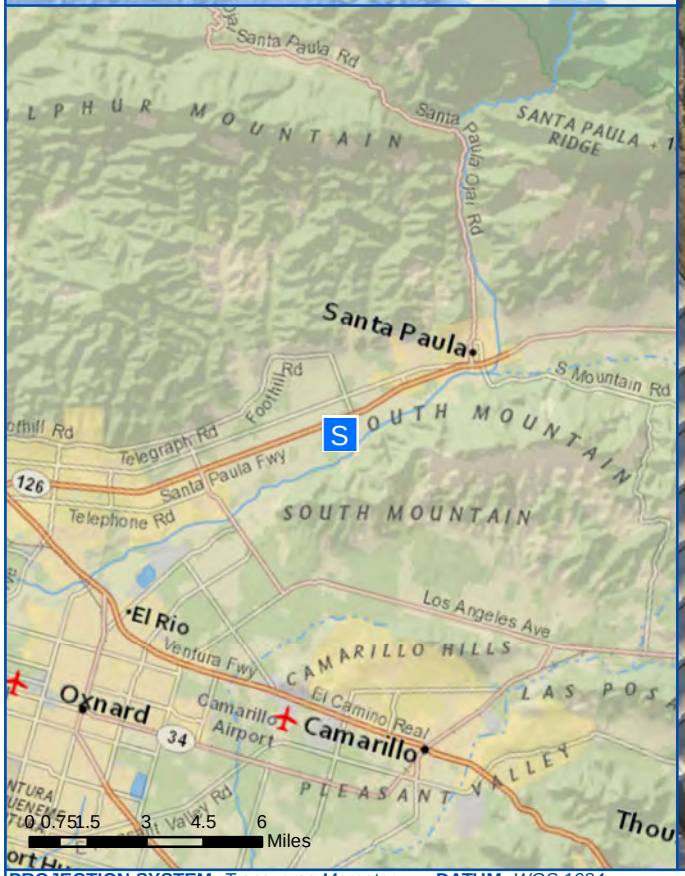
Incident Maps:

Real-time Air Monitoring Locations and Incident Site

Site Location

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura



PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/25/2014 9:42:14 AM*

Aerial Overview - 11/26/2014

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/27/2014 9:35:32 AM*

Manually Logged Real-Time Air Monitoring Concentrations

VOC - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 8:20:08 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2SO_4 - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/27/2014 8:23:20 AM*

Manually Logged Real-Time Air Monitoring Concentrations

PM_{10} - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84* **Print Date:** *11/27/2014 8:52:14 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Peroxides - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 8:21:10 AM*

Manually Logged Real-Time Air Monitoring Concentrations

O_2 - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 8:54:38 AM*

Manually Logged Real-Time Air Monitoring Concentrations

LEL - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 8:48:44 AM*

Manually Logged Real-Time Air Monitoring Concentrations

H_2S - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 8:53:21 AM*

Manually Logged Real-Time Air Monitoring Concentrations

SO_2 - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/27/2014 10:58:06 AM*

Manually Logged Real-Time Air Monitoring Concentrations

CO - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* COORDINATE SYSTEM: *WGS84*

Print Date: *11/27/2014 10:56:29 AM*

Manually Logged Real-Time Air Monitoring Concentrations

Cl_2 - Nov 26, 2014 07:00 to Nov 27, 2014 07:00

CTEH Project#: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

PROJECTION SYSTEM: *UTM13N* **COORDINATE SYSTEM:** *WGS84*

Print Date: *11/27/2014 10:53:54 AM*

Appendix B:

AreaRAE Trend Graphs, AM510 Trend Graphs, and AreaRAE/AM510 Air Monitoring Location Map

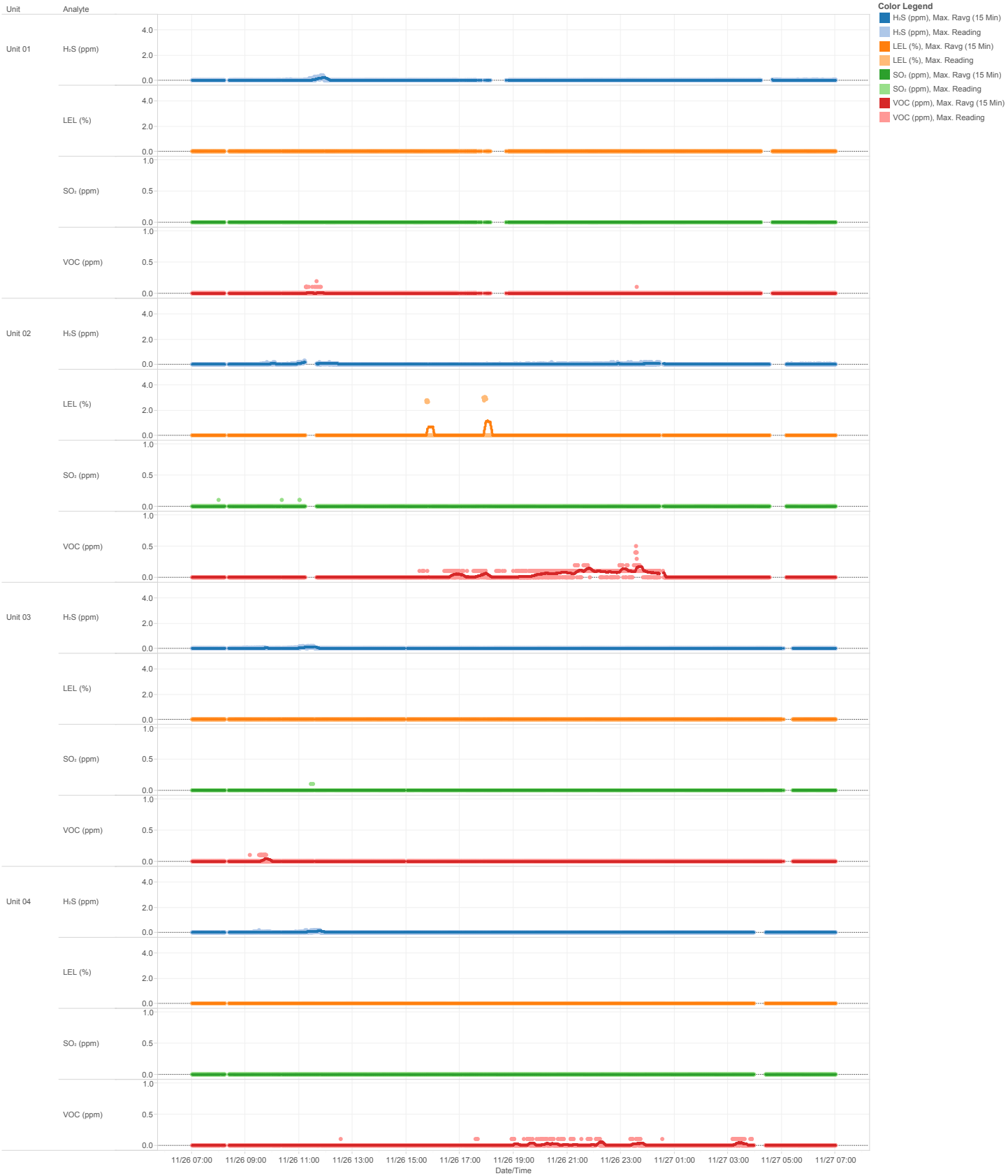
AreaRAE and AM510 Locations

Mission Incident

Project: 106846
Client: Patriot Environmental
City: Santa Paula, CA
County: Ventura

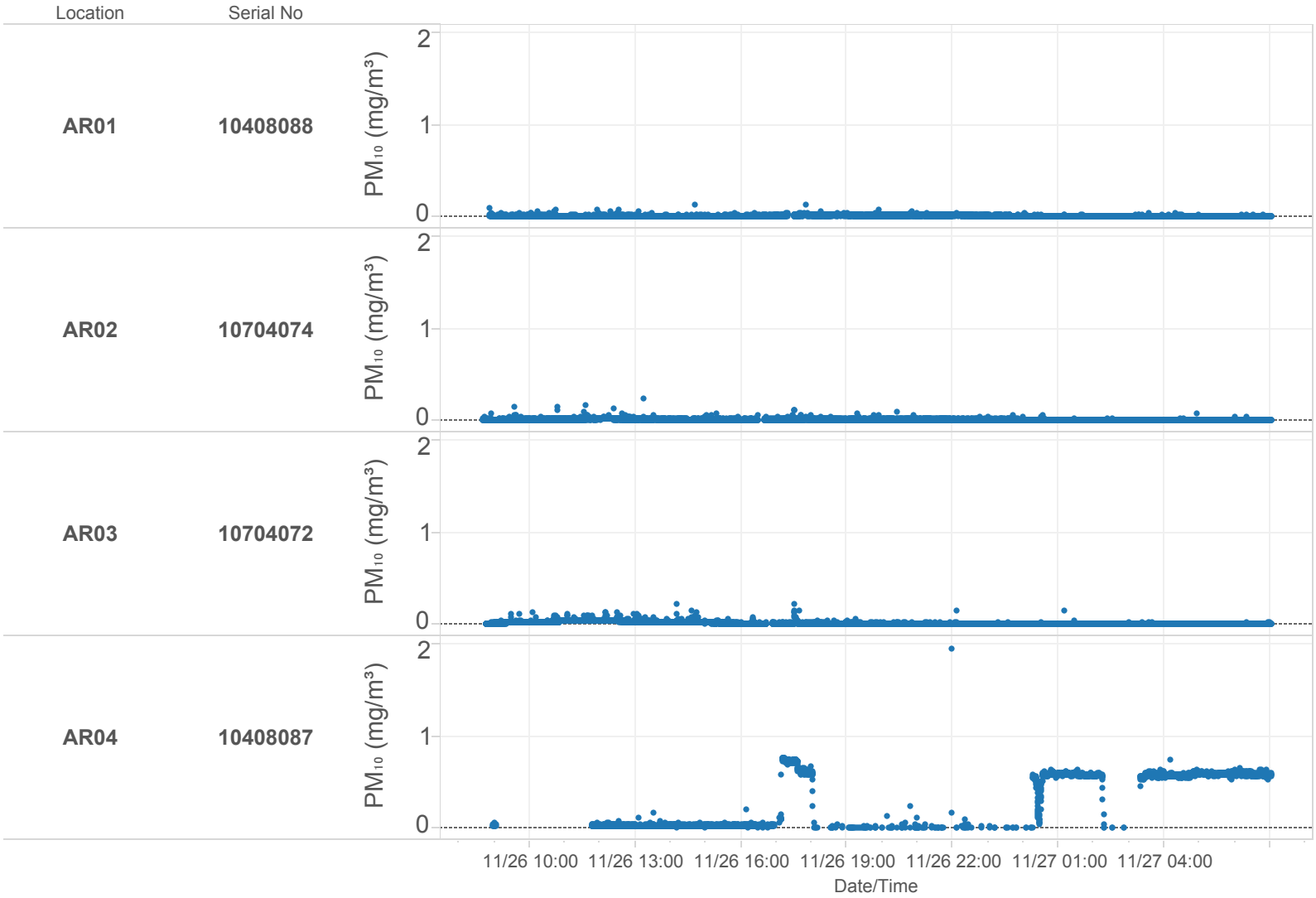
PROJECTION SYSTEM: *Transverse Mercator* **DATUM:** *WGS 1984* **LAST UPDATED:** *11/26/2014 11:37:30 AM*

Patriot Environmental
AreaRAE Trend Graphs
11/26/2014 07:00 - 11/27/2014 07:00



- The data set displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format
- AreaRAE data may contain "drift events." Drift is defined as interference in the electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere, resulting in "false positives"

Patriot Environmental
MISSION INCIDENT
Datalogged AM510 Summary
11/26/2014 07:00 - 11/27/2014 07:00



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